

How to reduce chemo side-effects



**PROVEN strategies & products
to help you through chemo**

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Introduction

Chemotherapy is highly toxic to the human body. The side-effects can cause terrible suffering, organ damage and death. Therefore, if you consent to have this treatment, it is crucial for both quality of life and survival that you do everything possible to mitigate its effects.

While your medical team will prescribe drugs to deal with some of the side-effects of cancer treatments, these can cause serious side-effects of their own.

However, there are other solutions (backed by studies) you can use to reduce side-effects, make your treatment work better and safer, and significantly improve your chances of survival.

These solutions (most of them natural) are listed in the following pages, with links to the studies. Of course, everyone is different so there's no guarantee any of these solutions will work for you. But then again...

Disclaimer.

I am not a medical practitioner. I produced this ebook because little of this information is ever made known to patients. You should always work with your doctor when adding any type of therapy to your treatment plan.

I hope this information will be of help to you and I wish you the very best on your healing journey.

Tommy Roche



1. Overall improvement in quality of life

The following can help:

Ashwaganda (*Withania somnifera*)

This [study](#) published in *Integrative Cancer Therapies* looked at Ashwaganda use in **100 breast cancer patients**. It found Ashwaganda improved quality of life and cancer treatment–related fatigue, with improvement in trend of overall survival.

European Mistletoe Extract (VAE)

This [study review](#) involved **over 8,000 patients**. It concluded VAE treatment seems to have an impact on QoL [quality of life] and reduces side effects of conventional therapies (chemotherapy, radiation) in experimental trials as well as in daily routine application... This benefit mainly relates to psychosomatic self regulation; to fatigue, sleep, exhaustion, and energy; to nausea, vomiting, and appetite; to emotional well-being, depression, anxiety, and concentration; to functional wellbeing and ability to work; and also, yet less consistently, to pain, diarrhea, general performance, and side effects of conventional cancer treatment.



Astragalus

This [study](#) of **1,409 patients** published in *Frontiers in Oncology* showed that Astragalus-based Chinese medicines combined with chemotherapy in the treatment of colorectal cancer may reduce chemotherapeutic agents-associated adverse reactions, and improve their life quality when compared with chemotherapy alone...

Daily Exercise (QOL)

This [study](#) published in *Current Sports Medicine Reports* says: Preliminary evidence consistently suggests that physical activity is not only safe but advantageous for cancer survivors in managing multiple side effects associated with cancer and cancer treatments. Overall, research suggests that aerobic activity, resistance training, a combination of both, and mindfulness forms of exercise such as yoga and Tai Chi are effective in reducing cancer survivors' complaints and improving QOL.

This [article](#) in *Frontiers in Clinical Drug Research (Vol 5)* says: physical exercise prolongs survival and reduces the mortality of these patients.

2. Request a Chemosensitivity Test

Chemosensitivity tests to guide your treatment

Chemosensitivity tests reveals which anti-cancer drugs are effective at killing each patient's cancer cells and which agents are not effective. The most promising drug regimen can be selected for each cancer patient, increasing the odds for treatment success. At the same time, ineffective drugs are avoided.

This spares the patient needless exposure to harmful side effects from drugs that can't possibly help them. Further, valuable treatment time is not wasted...

Source: [Weisenthal Cancer Group](#)



Chemosensitivity Tests are also known as Personal Cytometric Profiling.

This [study](#) published in the *Journal of Clinical Oncology* concluded: Despite various limitations of individual studies, the aggregate and fairly consistent evidence of these data suggests cytometric profiling to be accurate, to improve overall tumor response, and to increase 1-year patient survival.

This [article](#) published in *Chemosensitivity Testing in Oncology. Recent Results in Cancer Research, vol 161* says: In vitro drug response testing, first developed to assist in the selection of antibiotics for patients

with bacterial infections, has recently been demonstrated to accurately predict how cancer patients will respond to chemotherapy.

See cancerireland.ie for further details.

3. Check out these Chemotherapy options

Low Dose Metronomic Chemotherapy

Treatment in which low doses of anticancer drugs are given on a continuous or frequent, regular schedule (such as daily or weekly), usually over a long time. Low-dose chemotherapy causes less severe side effects than standard chemotherapy. Giving low doses of chemotherapy may stop the growth of new blood vessels that tumors need to grow. Also called metronomic chemotherapy.

Source: *National Cancer Institute*.

An [expert opinion](#) written on behalf of the “Metronomic Chemotherapy in Advanced Breast Cancer” Study Group states: The 2017 European Society of Oncology (ESO)

European Society of Medical Oncology (ESMO) International Consensus Guidelines for Advanced Breast Cancer state that mCHT [Metronomic chemotherapy] is an attractive option, which has been evaluated in the advanced setting with promising efficacy and a good toxicity profile...Although there is a lack of randomized clinical trials in mBC [metastatic breast cancer], mCHT has been shown to be effective and safe in multiple studies conducted in these patients, as reviewed previously. Overall, these studies suggest that mCHT has a favorable toxicity profile and is associated with a durable response.

Insulin Potentiated Therapy (IPT)

With IPT the insulin works on the cell membranes and allows chemotherapy to target cancer cells. Thus, it is the chemotherapy that kills the cancer cells, however, because of the insulin, the amount of chemotherapy needed is greatly reduced, meaning the side-effects of the chemotherapy are greatly reduced. Source: *Cancer Tutor*

[This research article](#) published in the *Journal of Cancer Science & Therapy* reported: Upon follow-up, 85 of 106 patients (80%) with advanced metastatic disease reported a subjectively significant improvement in their quality of life.

See [Insulin Potentiation Therapy](#) page

SEF Chemo

SEF Chemo: New treatment with no side-effects?

[Berkeley Institute International](#) are treating patients with SEF Chemo – a new treatment that is reportedly side-effects free. Here is some info from its website: SEF Chemo® is designed not only to minimize toxicity, but also to make chemotherapy more effective. Usually, only a fraction of the cells in a tumor is directly and immediately destroyed during chemotherapy. Many more cells are merely damaged. These damaged cells can repair themselves, continue to multiply, and spread the cancer.

See more on [SEF Chemo](#) page

4. Make Chemotherapy Work Better

Studies show that the effectiveness of chemo can be enhanced. Here are some examples:

Get treatment at the right time of day.

Cancer chronotherapy consists in administering treatment at an optimal time. Because the body is governed by precise biological rhythms, the efficacy of anti-cancer drugs can be doubled and their toxicity reduced five-fold depending on the exact timing of their administration. Source: www.sciencedaily.com

[This study](#) published in *The Lancet* says: Rhythms in cell function and proliferation circadian rhythms account



for predictable circadian changes in cancer-treatment tolerability and efficacy. The extrapolation, from mice to human beings, of the least toxic times to administer chemotherapy has been validated in patients with metastatic colorectal cancer in phase III clinical trials... Thus, the median survival of patients with colorectal cancer metastases who receive chronotherapy has consistently ranged from 16 to 21 months, the longest time reported for this disease in multicentre trials.

Whole body Hyperthermia

A type of treatment in which body tissue is exposed to high temperatures to damage and kill cancer cells or to make cancer cells more sensitive to the effects of radiation and certain anticancer drugs.

[This study](#) says: Whole Body Hyperthermia combined with chemotherapy is efficient and safe for advanced cancer, and is worth generalizing extensively.

See also [Hyperthermia](#) page

Hyperbaric Oxygen Therapy (HBOT)

Hyperbaric oxygen may increase the amount of oxygen in cancer cells, which may make them easier to kill with radiation therapy and chemotherapy.

This [study](#) published in *Medical Oncology* says: We conclude that the administration of HBO can provide many clinical benefits in the treatment of tumours, including management of highly malignant gliomas... HBO can also increase the cytostatic effect of certain drugs, which may render standard chemotherapy more effective.

This [review](#) points out that a previous study by Mayer et al. lists five chemotherapeutic agents (doxorubicin, bleomycin, disulfiram, cisplatin, and mafenide acetate); all of which are strongly contradictory in combination with HBO due to potential potentiation of toxicity.

See [Hyperbaric Oxygen Therapy](#) page for more details.

Short-term Fasting

[This study](#) published in the *Journal of Experimental & Clinical Cancer Research* says: Abundant and convincing preclinical evidence shows that STF [short-term fasting] can decrease toxicity and simultaneously increase efficacy of a wide variety of chemotherapeutic agents.



See [Short-term fasting to treat cancer](#) page.

Metformin

[Study](#): metformin in combination with paclitaxel or cisplatin improved the sensitivity in drug-resistant ovarian cancer cells. Therefore, metformin may be beneficial treatment strategy, particularly in patients with tumors refractory to platinum and taxanes.

American Ginseng

This [study](#) published in *Pharmacological Reports* found for the first time, with mechanism-based evidence, that extracts of American Ginseng exhibits potent cytotoxicity cancer stem cells and also sensitized the cancer stem cells to clinically relevant doses of cisplatin and paclitaxel.

w-3 long chain polyunsaturated fatty acids

This [study](#) published in the *International Journal of Molecular Sciences* says: ...most studies have demonstrated that DHA and EPA improve the efficacy of chemotherapy...some studies indeed have reported a reduction of tumor-related or chemotherapy-related side effects, such as cachexia, osteoporosis, neutropenia, cardiotoxicity, and diarrhea.

Ashwagandha (*W. somnifera*)

This [study](#) published in *PLOS ONE* says: In this study we demonstrate that 'priming', in HT-29 colon cells, with *W. somnifera* root extract increased the potency of the chemotherapeutic agent cisplatin.

Green Tea

This [study](#) published in *Clinical Cancer Research* says: These results suggest that drinking green tea can encourage cancer chemotherapy and may improve the quality of life of clinical patients.



Genistein

[This study](#) published in *Obstetrics & Gynecology Science* says: Genistein enhances the anticancer effect of cisplatin...and can be used as a chemotherapeutic adjuvant to increase the activity of a chemotherapeutic agent.

Fermented Wheat Germ Extract (FWGE)

This [study](#) published in *Nutrition Journal* found: Clinical data from a randomized phase II trial in melanoma patients indicate a significant benefit for patients treated with dacarbazine in combination with FWGE in terms of progression free survival (PFS) and overall survival (OS). Similarly, data from studies in colorectal cancer suggested a benefit of FWGE treatment. In conclusion, available data so far, justify the use of FWGE as a non-prescription medical nutriment for cancer patients.



See [Avermar](#) page

Quercetin

This [study](#) published in *Oncology Letters* says: We suggest that inclusion of quercetin to the conventional chemotherapeutic agent 5-FU may be an effective therapeutic strategy for esophageal cancer.

This 2020 [Study](#) published in *Cell and Bioscience* says: According to the obtained evidences, quercetin can prevent ovarian cancer through a couple of mechanisms including anti-inflammation, pro-oxidation, anti-proliferation, and cell cycle arrest.

Melatonin

This [Study](#) published in *Oxidative Medicine and Cellular Longevity* says: One clinical trial included **70 cancer patients** (advanced NSCLC) who were treated with a combination of cisplatin plus etoposide or the chemotherapy drugs plus melatonin. On the basis of complete and partial tumor response rate, melatonin enhanced the effect of cisplatin

plus etoposide, and improved the 1-year survival rate. Furthermore, the incidences of myelosuppression, neuropathy, and cachexia were significantly reduced, indicating that patients treated with melatonin had better tolerance to chemotherapy. Another clinical trial treated a total of **250 patients with metastatic solid tumors** who were given a variety of different chemotherapies alone or in combination with melatonin. The objective tumor regression rate and the 1-year survival rate were again improved by melatonin cotreatment. Moreover, melatonin significantly alleviated the incidence of thrombocytopenia, neurotoxicity, cardiotoxicity, stomatitis, and asthenia

Berberine

This [Study](#) published in the *Journal of Cancer* says: ...our findings demonstrate that berberine sensitizes drug-resistant breast cancer to chemotherapy and directly induces apoptosis [programmed cell death]. Berberine appears to be a promising chemosensitizer and chemotherapeutic drug for breast cancer treatment.

Curcumin

This [Study](#) published in *Journal of the Korean Society for Applied Biological Chemistry* says: ...combination use of curcumin and available anticancer drugs has great potential to enhance chemotherapy efficacy and improve clinical treatment of cancer.

See [Curcumin](#) page

Aloe Vera

This [Study](#) published in *In Vivo* says:
The percentage of both objective tumor regressions and disease control was significantly higher in patients concomitantly treated with Aloe than with chemotherapy alone, as well as the percent of 3-year survival patients.

Dipyridamole

This [Study](#) published in *American Journal of Translational Research* says: Dipyridamole (DIP) inhibits thrombus [clot] formation when given chronically, and causes vasodilation over a short time. To date, DIP can increase the anticancer drugs (5-fluorouracil, methotrexate, piperidine,



vincristine) concentration in cancer cells and hence enhance the efficacy of cancer treatment. The inhibition of DIP may result in increased 5-fluorouracil efficacy and diminish the drug side effects.

Hedyotis Diffusa

An herb used in traditional Chinese medicine to treat certain medical problems. It has been used to boost the immune system and may have anticancer effects. Source: *National Cancer Institute*.

This [study](#) published in *Evidence-based Anticancer Materia Medica* says: Both pre-clinical and clinical studies have established the efficacy and safety of spreading hedyotis in treating various cancers including stomach cancer, liver cancer, lung cancer, esophagus cancer, and leukemia. It can directly inhibit the growth of various cancer cells...It also has immune modulation functions against cancer...Clinical outcomes have demonstrated that it can enhance the efficacies and reduce the adverse effects (i.e. white blood cell decrease, nausea/vomit) by the conventional chemotherapies. It is also effective in relieving cancerous pain and fever.

Flufenamic acid

This [study](#) published in *Nature* says: One particular non-steroidal anti-inflammatory drug, flufenamic acid...decreased the cisplatin-resistance and invasion potential of metastatic sublines

Methadone

This [2017 study](#) published in *Frontiers in Oncology* says: There is evidence from preclinical studies that methadone could also elicit antitumor activity by downregulating the threshold of apoptosis and to enhance the effects of different chemotherapeutic agents. This confirms the concept of using methadone as a chemosensitizer in the future treatment of cancer.



5. Reduce Cancer Cachexia risk

By some estimates, nearly **one-third of cancer deaths** can be attributed to a wasting syndrome called cachexia, according to the *National Cancer Institute*.

This [study](#) published in *Oncotarget* says: Cancer Cachexia affects 50–80 % of advanced cancer patients, with currently no effective treatments. Cachexia is defined by increased fatigue and loss of muscle function. This results in diminished physical activity, reduced tolerance to anticancer therapies and decreased survival. Available evidence suggests that chemotherapy (i.e. the use of cytotoxic and anti-proliferative drugs) may play a key role in the development and sustainment of cachexia.

The following can help:

Physical activity

This [2019 study](#), published in the *American Journal of Lifestyle Medicine* concluded: Muscle metabolic health and mass are dramatically affected by physical activity and exercise. Physical activity and exercise are already thought to be beneficial during cancer treatment and survival and hold clear potential as a nonpharmacological treatment for muscle wasting conditions.



See [Physical Exercise](#)

Melatonin (MLT)

A hormone made by the pineal gland. Melatonin helps control the body's sleep cycle, and is an antioxidant. It is also made in the laboratory and sold as a supplement. Source: *National Cancer Institute*.

[Study](#) published in *European Journal of Cancer* states: ... this study shows that MLT may counteract weight loss that occurs with progressing cancer...

Study: a randomized study was carried out in patients with metastatic solid tumors comparing a combination of low-dose IL-2 plus melatonin with best supportive care. In the treated group, the percentage of patients with improved performance status, as well as overall survival, was significantly higher than the controls.

See [Melatonin](#) page

Cannabinoids

A type of chemical in marijuana that...may help treat the symptoms of cancer or the side effects of cancer treatment. Source: *National Cancer Institute*.



Study published *Current Oncology* says: Cannabis is useful in combatting anorexia, chemotherapy-induced nausea and vomiting, pain, insomnia, and depression. Cannabis might be less potent than other available antiemetics, but for some patients, it is the only agent that works, and it is the only antiemetic that also increases appetite.

Omega 3 Fatty Acids

Study published in *Current Problems in Cancer* says: patients with the lowest n-3 fatty acids in plasma PL experience muscle loss whereas those with the highest n-3 fatty acids gain muscle over the course of chemotherapy.

Study published in *GUT* states: In cancers where high inflammatory stress is usual, protein rich supplements containing n-3 polyunsaturated fatty acids and high levels of antioxidant vitamins can reverse severe weight loss.

[[cancerireland.ie](#) note:

The 3 major antioxidant vitamins are beta- carotene, vitamins C and vitamin E.]

Using Antioxidants during chemo

Many oncologists advise against taking supplemental antioxidants during chemotherapy. Many integrative oncologists and practitioners, on

the other hand, believe that antioxidants taken during treatment not only alleviate some of the treatment side effects but also enhance the efficacy of the treatment.

The latter view is supported by this 2018 [Study Review](#) published in the *Saudi Pharmaceutical Journal*. It encompasses a total of 174 peer-reviewed original articles comprising 93 clinical trials with a cumulative number of 18,208 patients, 56 animal studies and 35 *in vitro* studies.

The authors say their data suggests that antioxidant has superior potential of ameliorating chemotherapeutic induced toxicity. Antioxidant supplementation during chemotherapy also promises higher therapeutic efficiency and increased survival times in patients.

Pomegranate

[Study](#) published in *Current Problems in Cancer* says: COX-2 expression is increased in cachexia...Pomegranate juice resulted in the highest level of COX-2 suppression (79%) compared to treatment with single constituents. The effects are attributed to synergistic activity of the various pomegranate components necessary for anti-inflammatory and anti-carcinogenic activity.

Endurance training

[Study](#) published in *American Journal of Lifestyle Medicine* says: Muscle metabolic health and mass are dramatically affected by physical activity and exercise. Physical activity and exercise are already thought to be beneficial during cancer treatment and survival and hold clear potential as a non-pharmacological treatment for muscle wasting conditions.

[Review](#) published in *Applied Physiology, Nutrition, and Metabolism* recommends patients to maintain as much physical activity as possible, given their particular impediments, during cancer treatment and recovery. The recommendation for healthy individuals is of at least 150 min of



moderate-intensity or 75 min of vigorous-intensity activity each week, or an equivalent combination, preferably distributed throughout the week.

Hydrazine Sulfate

A substance that has been studied as a treatment for cancer and as a treatment for cachexia (body wasting) associated with advanced cancer. Source: *National Cancer Institute*.

Study: There is good evidence that hydrazine sulfate inhibits gluconeogenesis [converting fats or proteins into sugar]. Therefore, it may play a role in reducing the severity of cachexia and in improving the quality of life of cancer patients. Dr. Joseph Gold, an American research oncologist, found that in clinical studies, the use of hydrazine sulfate resulted in improved appetite and reduced weight loss, and he proposed that it be used as an adjuvant therapy to prevent cachexia.

Low carbohydrate diet

Study published in *BMC Medicine* says: a switch to a low carbohydrate/ketogenic diet has been shown to prevent cachexia in patients undergoing chemotherapy, suggesting this dietary approach may be a suitable alternative for cancer patients at risk of cachexia, sarcopenia, and weight loss.



Metoclopramide

A drug used to treat certain stomach problems and nausea and vomiting caused by chemotherapy.

Source: *National Cancer Institute*.

Study: Metoclopramide significantly reduced many CADS [cancer-associated dyspepsia syndrome] symptoms in our group of **20 advanced cancer patients**. Higher doses or different dose schedules might have been superior. Overall our study group enjoyed a 53% reduction in symptoms, with anorexia, bloating, belching, and nausea significantly relieved after treatment.

Megestrol

A drug used to treat advanced breast and endometrial cancer. It is also being studied in the treatment of anorexia and cachexia in patients with cancer – *National Cancer Institute*.

[Study](#) published in *Radiotherapy and Oncology* says: Megestrol acetate can significantly decrease the degree of body weight loss, and can prevent the deterioration of appetite in patients with head and neck cancers receiving radiotherapy.

See [Reduce Cachexia Risk](#) page.

6. Strengthen your immune system

Immune System: A complex network of cells, tissues, organs, and the substances they make that helps the body fight infections and other diseases – *National Cancer Institute*.

[Study](#) published in *Future Oncology* says: Chemo drugs can damage healthy immune cells... the killing of immune cells can also enhance tumor growth

Proper Sleep

[Study](#) published in *Pflugers Archiv* says: Sleep and the circadian system exert a strong regulatory influence on immune functions. Prolonged sleep curtailment produces pro-inflammatory cytokines, best described as chronic low-grade inflammation, and also produce immunodeficiency, which both have detrimental effects on health.



Enzymatically Modified Rice Bran

[Study](#) published in *Integrative Cancer Therapies* says: There is sufficient evidence suggesting MGN-3 [rice bran extract] to be an effective immunomodulator that can complement conventional cancer treatment. See [MGN-3](#) page.

Laughter

[Study](#) published in *Evidence-based Complementary and Alternative Medicine* says: Findings from this study support that the act of laughing is correlated to changes in stress and immune function following exposure to a humor stimulus. Laughing can apparently reduce stress and improve NK [natural killer] cell activity, at least temporarily. As low NK cell activity is linked to decreased disease resistance and increased morbidity in persons with cancer and HIV disease, the authors conclude that laughter may be a useful cognitive-behavioral intervention for use in these patients.

Sex

This [study](#) published in *Neuroimmunomodulation* concluded: ...this study demonstrates for the first time that sexual activity and orgasm induce transient increases in the circulation of lymphocyte subpopulations, in particular NK [natural killer] cell numbers, in man.

Meditation

[Study](#) published in *Neuroscience* says: Kiecolt-Glaser discovered that the elderly in a retirement home who practised a relaxation technique, showed a significant increase in their immune defences against viruses and tumors (Kiecolt-Glaser et al., 1985); and in another study, he pointed out how medical students who used such techniques during examination preparation, a source of stress, showed higher levels of T-helper cell antibodies which fight infectious diseases (Kiecolt-Glaser et al., 1986).



Daily Exercise

[Study](#) published in *Oncology* says: NK [natural killer] cell number significantly increases following a single bout of exercise... Exercise is a pleiotropic strategy that may be a promising candidate therapy for the treatment of cancer. ...The evidence reviewed in this paper suggests that exercise has immunomodulatory effects that could alter multiple

critical phases of immune system–tumor cross-talk in both tumor initiation and progression

Study: In this systematic review, we found that Natural Killer cytotoxic activity increased after exercise in cancer patients...

Eat a Good Diet

Study published in *Journal of Translational Medicine* says: ...nutritional supplementation with arginine, omega-3 fatty acids and nucleotides results in a marked improvement of immune functions in cancer patients undergoing surgery and a reduction in infectious complications, hospital stay and co-morbidities



Probiotics

Study published in *International Journal of Molecular and Cellular Medicine* says: Probiotic bacteria have recently become the focus of research because of their anti-cancer properties. In addition, they have been shown to change expression of different genes participating in cell death and apoptosis, invasion and metastasis, cancer stem cell maintenance as well as cell cycle control.



Betternutrition.com lists the top Probiotic Foods as Yogurt and kefir (dairy- or plant-based), Sauerkraut, Kimchi, Kvass (a fermented beet drink), Natto, Miso, Kombucha, Raw cheese from goat's or sheep's milk.

Study published in *Critical Reviews in Food Science and Nutrition* states: Consumption of probiotic organisms in the form of fermented milk or yogurt has been shown to increase cellular immunity in elderly subjects and children. It is well established that the intestinal microflora affects the development and functioning of the immune system, so it is reasonable to conclude that intestinal microflora could be modulated by using probiotic organisms, which could provide means of improving the immune status of healthy and unhealthy individuals.

Study published in *Journal of Medicinal Food* states: Health functionality of kimchi, based upon our research and that of other, includes anticancer, ... immune promotion, and skin health promotion.

Natural vitamin supplements etc

See a comprehensive list on [Immune boosters](#) page.

7. Reduce nausea and vomiting

A number of drugs are used to treat nausea, but other, less toxic therapies have also been proven to help patients. These include:

Cannabinoids

[Study](#) published in *British Journal of Pharmacology* says: Considerable evidence demonstrates that manipulation of the endocannabinoid system regulates nausea and vomiting in humans and other animals. The anti-emetic effect of cannabinoids has been shown across a wide variety of animals that are capable of vomiting in response to a toxic challenge.

Although chemotherapy-induced vomiting is well controlled in most patients by conventionally available drugs, nausea (acute, delayed and anticipatory) continues to be a challenge. Nausea is often reported as more distressing than vomiting, because it is a continuous sensation. Indeed, this distressing symptom of chemotherapy treatment (even when vomiting is pharmacologically controlled) can become so severe that as many as 20% of patients discontinue the treatment.

Both preclinical and human clinical research suggests that cannabinoid compounds may have promise in treating nausea in chemotherapy patients.

Ginger Supplements

[Study of 576 patients](#) published in *Supportive Care in Cancer* concluded: Ginger supplementation at daily dose of 0.5g-1.0g significantly aids in reduction of the severity of acute chemotherapy-induced nausea in adult cancer patients.



[Study](#) published in *The Asian Pacific Journal of Cancer Prevention* says: According to the findings of this study, it should be declared that taking

ginger capsules (1 g/day) might relieve Chemotherapy-induced nausea and vomiting safely.

According to [this review](#) this is the best treatment (along with massage).

[Study](#) published in *Chemotherapy Research and Practice* says: This plant induces acceptable effects on the reduction of Chemotherapy-induced nausea and vomiting. In the end, based on the results of this study, it can be generally concluded that *Zingiber officinale* (in form of ginger capsule) is the best option among anti-nausea medications to Chemotherapy-induced nausea and vomiting.

Hypnosis

[Study](#): Evidence has shown that hypnosis can effectively treat anticipatory Chemotherapy-induced nausea and vomiting and early research indicates that alternative treatments such as acupuncture and massage may also be beneficial in prevention of Chemotherapy-induced nausea and vomiting.

Accupressure

[Study](#) published by *Oncology Nursing Society* states: With delayed nausea and vomiting, the accupressure group had a statistically significant reduction in the amount of vomiting and the intensity of nausea over time when compared with the placebo and usual-care groups.

Massage and Inhalation Aromatherapy

[Study](#) published in *Cancer Nursing* concluded: Nausea severity was significantly lower in the massage and inhalation aromatherapy groups than in the control group. Nausea and retching incidence was reduced in the aromatherapy groups compared with that in the control group.



Taurine

[Study of 40 patients](#) published in *Academia* says: The present study successfully demonstrated that taurine can decrease the incidence of chemotherapy-induced nausea and vomiting and attenuate chemotherapy-induced taste and smell impairment and fatigue in ALL [acute lymphoblastic leukemia] patients during their maintenance chemotherapy.

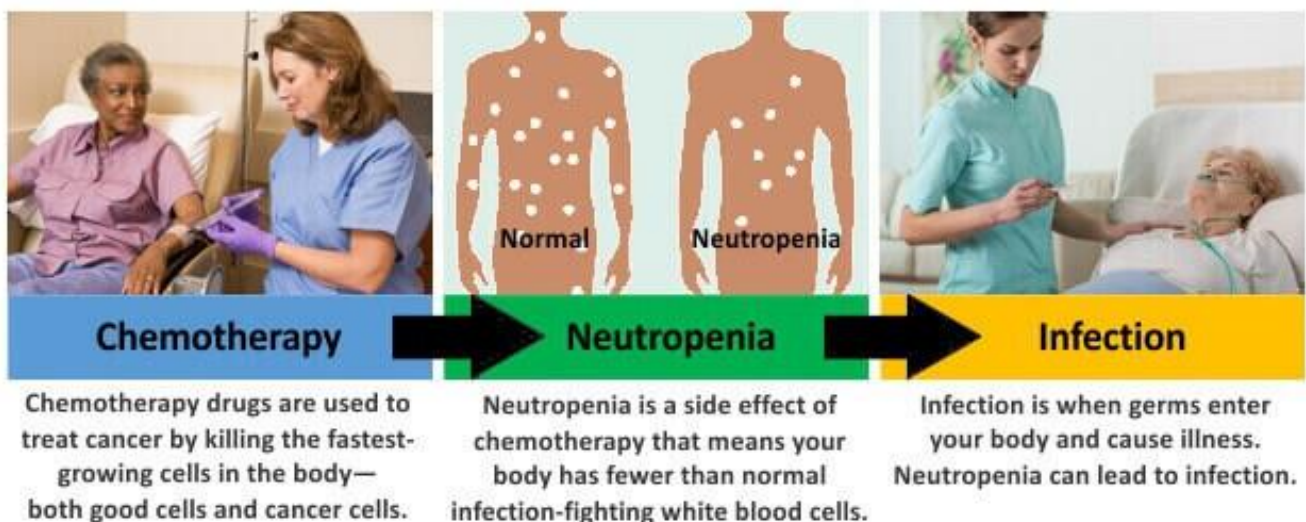
8. Avoid dangerous infections

White blood cells (WBCs) fight infections from bacteria, viruses, fungi, and other pathogens (organisms that cause infection). A low white blood cell count is one of the more serious side effects of chemotherapy.

Source: *MedlinePlus*

[Study](#) published in *Clinical Journal of Oncology Nursing* says: Despite advances in oncology care, infections from both community and healthcare settings remain a major cause of hospitalization and death among patients with cancer receiving chemotherapy. Neutropenia (low white blood cell count) is a common and potentially dangerous side effect in patients receiving chemotherapy treatments and may lead to higher risk of infection. Preventing infection during treatment can result in significant decreases in morbidity and mortality for patients with cancer.

How Chemotherapy Increases Risk for Infections



Sepsis

According to the *Center for Disease Control (CDC)* SEPSIS is a complication caused by the body's overwhelming and life-threatening response to infection which can lead to tissue damage, organ failure, and death. For a person with cancer, any infection that is anywhere in your body can lead to sepsis

What are the signs and symptoms of an infection?

Watch for signs of an infection, such as:

- Fever, chills or sweats
- Redness, soreness, or swelling in any area, including surgical wounds and ports
- Diarrhea and/or vomiting
- Sore throat, cough or nasal congestion
- New sore in the mouth
- Shortness of breath
- Stiff neck
- Unusual vaginal discharge or irritation
- New onset of pain
- Changes in skin, urination, or mental status

What are the signs and symptoms of sepsis?

Sepsis is a bad outcome from an infection. There is no single sign or symptom of sepsis. It is, rather, a combination of symptoms.

A person with sepsis might have one or more of the following signs or symptoms:

- High heart rate or weak pulse
- Fever, shivering, or feeling very cold
- Confusion or disorientation
- Shortness of breath
- Extreme pain or discomfort
- Clammy or sweaty skin

A medical assessment by a healthcare professional is needed to confirm sepsis.

How can I reduce my risk for infection?

Hand washing is the number one way to prevent infections. This should include you, all members of your household, your doctors, nurses and anyone that comes around you. Don't be afraid to ask people to wash their hands. Washing your hands with soap and water is the most effective, but it's OK to use an alcohol-based hand sanitizer if soap and water are not available.

You should wash your hands:

- Before, during, and after cooking food
- Before you eat
- After going to the bathroom
- After changing diapers or helping a child to use the bathroom

- After blowing your nose, coughing, or sneezing
- After touching your pet or cleaning up after your pet
- After touching trash
- Before and after treating a cut or wound or caring for your catheter, port, or other access device.

You should also do the following:

- Protect your skin from scrapes and cuts
- Maintain good oral and body hygiene practices
- Practice proper wound care
- Use disinfectants to keep your household surfaces free of germs
- Avoid situations where you might come into close contact with people who may be sick
- Use disinfectants to keep your household surfaces free of germs
- Protect your skin from direct contact with pet bodily waste (urine or feces)

9. Reduce Chemotherapy-induced Peripheral Neuropathy (CIPN)

Chemotherapy-induced peripheral neuropathy (CIPN) is one of the most frequent side effects caused by antineoplastic agents, with a prevalence from 19% to over 85%. **(CIPN) symptoms vary from patient to patient, but in general, side effects include:**

- feeling of numbness or “pins and needles” in your hands and feet;
- ringing in your ears or loss of hearing;
- changes in vision;
- sudden, stabbing pains in your hands or feet;
- muscle weakness or cramps;

The following can help:

Ice cap, frozen socks and gloves

This [study](#) of 36 patients published in *The Journal of the National Cancer Institute* says: Breast cancer patients treated weekly with paclitaxel (80 mg/m² for one hour) wore **frozen gloves and socks** on the dominant side for 90 minutes, including the entire duration of drug infusion. The researchers found that the hands and feet that wore the

frozen gloves and socks had less loss of sensitivity to touch and temperature than the hands and feet that didn't wear the frozen garments:

- 27.8% of the hands that wore the frozen gloves lost some sensitivity to touch
- 80.6% of the hands that didn't wear the frozen gloves lost some sensitivity to touch
- 25.0% of the feet that wore the frozen socks lost some sensitivity to touch
- 63.9% of the feet that didn't wear the frozen socks lost some sensitivity to touch
- 8.8% of the hands that wore the frozen gloves lost some sensitivity to warmth
- 32.4% of the hands that didn't wear the frozen gloves lost some sensitivity to warmth
- 33.4% of the feet that wore the frozen socks lost some sensitivity to warmth
- 57.6% of the feet that didn't wear the frozen socks lost some sensitivity to warmth



Cold Therapy Socks & Hand Ice Pack Cold Gloves for Chemotherapy Neuropathy, (Amazon)

Omega-3 fatty acids

Study of 57 breast cancer patients published in the *Journal of Clinical Oncology* says: Omega-3 fatty acids may be an efficient neuroprotective

supplement for prophylaxis against PIPN. They were able to reduce the incidence of PIPN [paclitaxel-induced peripheral neuropathy] in these study patients. Patients with breast cancer have a longer disease free survival rate with the aid of therapeutical agents. Finding a way to solve the disabling effects of PIPN would significantly improve the quality of life of these cancer patients.

Ginkgo Biloba

Study Review (17 patients) published in *Evidence-Based Complementary and Alternative Medicine* says: Marshall et al. investigated retrospectively 17 patients with colorectal cancer who received oxaliplatin along with *Ginkgo biloba*...The researchers found that 11 of the 17 patients developed a grade 1 peripheral neuropathy (PN) after the first cycle of oxaliplatin. Five of six patients who received *Ginkgo biloba* after the second cycle of

oxaliplatin reported decreased intensity and duration of sensory PN. No *Ginkgo biloba* related side effects have been observed. The data suggested that *Ginkgo biloba* extract appears to attenuate the intensity and duration of acute dysesthesias caused by oxaliplatin and may yield synergistic antitumor activity.

Sweet bee venom

Bee venom is made by bees. This is the poison that makes bee stings painful. Bee venom is sometimes used to make medicine.



Study Review (11 patients using Sweet Bee

Venom) published in *Evidence-Based Complementary and Alternative Medicine* says: A total of 11 eligible consecutive CIPN patients were treated for 3 weeks and observed for another 3 weeks. A significant intraindividual improvement was found for pain and neuropathy scales.

Chai Hu Long Gu Mu Li Wan

Study Review (48 patients) published in *Evidence-Based Complementary and Alternative Medicine* says: Chinese randomized trial in which 48 patients with ovarian cancer were examined parallel to chemotherapy with paclitaxel. They were divided into a treatment group with paclitaxel alone and a treatment group with paclitaxel plus a combination of oral Chinese herbal decoction treatment and external

washing of the feet with Chinese herbs... The incidence of CIPN was almost half as high in the patients treated additionally with Chinese herbs as evaluated by clinical testing.

Goshajinkigan

Study of 29 patients published in *Experimental and Therapeutic Medicine* says: In this study, we investigated the efficacy of Goshajinkigan, a traditional Japanese herbal medicine, for TC [Paclitaxel/carboplatin chemotherapy] therapy-induced peripheral neuropathy. The subjects included in our study were patients with ovarian or endometrial cancer who underwent TC therapy and developed peripheral neuropathy. The patients were randomly divided into Group A, comprising of 14 patients (vitamin B12 treatment), and Group B, comprising of 15 patients (vitamin B12 + Goshajinkigan treatment)...grade 3 neurotoxicity developed in 2 patients (14.3%) after 6 weeks of administration in Group A, whereas no neurotoxicity was observed in Group B... This suggests that Goshajinkigan inhibits the progression of peripheral neuropathy.

Study of 45 patients published in *International Journal of Clinical Oncology* says: 45 patients treated with modified FOLFOX6 for non-resectable or recurrent colorectal cancer participated in the study. Twenty-two patients (Goshajinkigan group) received oral administration of 7.5 g/day of Goshajinkigan every day during mFOLFOX6 therapy and 23 patients (control group) did not receive Goshajinkigan. The incidence of grade 3 peripheral neuropathy in the Goshajinkigan group was significantly lower than in the control group. The incidence of grade 3 peripheral neuropathy after 10 courses was 0% in the Goshajinkigan group and 12% in the control group, and after 20 courses was 33% in the Goshajinkigan group and 75% in the control group. The percentage of grade 2 and 3 peripheral neuropathy in the Goshajinkigan group was lower than that in the control group. There were no differences in adverse effects between the two groups except for peripheral neuropathy and influence on tumor response.

Study of 82 patients says: Paclitaxel (PTX) is frequently used for a chemotherapy of breast cancer and gynecologic cancer. We have also found that Gosya-jinki-gan was possibly effective for the treatment and the prevention of peripheral neuropathy. Additionally Gosya-jinki-gan might be more effective for peripheral neuropathy when it is administered from the beginning of chemotherapy including Paclitaxel.

Grains and Citrus Fruits

Study of 1468 patients published in *Breast Cancer Research* says: 1460 participants completed the baseline questionnaire including foods usually eaten over the last 12 months prior to cancer diagnosis, and 1234 patients completed the 6-month follow-up regarding diet during treatment...we observed significant inverse associations between neuropathy and consumption of grains, and marginally significant positive associations with consumption of citrus fruits.



Vitamin E

Meta-Analysis involving 555 patients:

Available data included in this meta-analysis showed that vitamin E supplementation can confer modest improvement in the prevention of CIPN [chemotherapy-induced peripheral neuropathy].



Meta-Analysis (319 patients) published in *International Journal for Vitamin and Nutrition Research* says: ...vitamin E supplementation had a significant effect on CIPN prevention...Subgroup analysis by chemotherapeutic agent type was only available for cisplatin and showed that vitamin E supplementation significantly reduced the incidence of CIPN.

Study of 27 patients published in *Journal of Clinical Oncology* says: The severity of neurotoxicity, measured with a comprehensive neurotoxicity score based on clinical and neurophysiological parameters, was significantly lower in patients who were supplemented with vitamin E than in patients who were not supplemented with vitamin E.

Capsaicin patch

Study of 16 patients published in *Journal of Pain Research* says: In this study, CIPN patients reported significant pain reduction following a single 30 min treatment with the capsaicin 8% patch – in spontaneous pain, touch-evoked pain and cold-evoked pain... Capsaicin 8% patch provides significant pain relief in CIPN, and may lead to nerve regeneration and restoration of sensory nerve fibers ie, disease modification.

Magnesium

Study of 196 colorectal cancer patients published in *Nutrients* says: Chronic CIPN was assessed 12 months after diagnosis using the quality of life questionnaire CIPN20...CIPN was reported by 160 (82%) patients. Magnesium intake during chemotherapy was statistically significantly associated with lower prevalence of CIPN...Furthermore, higher dietary intake of magnesium during and after chemotherapy was associated with less severe CIPN.



N- acetylcysteine

Study of 14 stage III colon cancer patients published in *Supportive Care in Cancer* says: We concluded that oral N-acetylcysteine reduces the incidence of oxaliplatin induced neuropathy in colon cancer patients receiving oxaliplatin-based adjuvant chemotherapy.

Alpha-lipoic acid

Study: Alpha-lipoic acid may represent a promising adjuvant therapy to attenuate paclitaxel-associated neuropathy and doxorubicin-induced cardiotoxicity in women with breast cancer.

10. Reduce Chemobrain

For decades, cancer survivors have described experiencing problems with memory, attention, and processing information months or even years after treatment. Because so many of these survivors had chemotherapy, this phenomenon has been called “chemobrain” or “chemofog,” – *National Cancer Institute*.

From many sources of data, we now know patients experience impairments not just after chemo, but after surgery, radiation, hormonal therapy, and other treatments – *Patricia Ganz, M.D.*

The following can help:

Physical Exercise

[Study](#) published in *Neuropharmacology* says: Our findings suggest that low-intensity exercise

may aid in preventing or attenuating cognitive dysfunction in patients with various forms of cancer undergoing chemotherapy.

Neurofeedback

A treatment being studied to improve brain function in certain brain disorders and in patients treated with chemotherapy for breast cancer. Sensors are placed on a person’s head, which allows brain activity to be shown as patterns on a computer screen. A beep or a tone may be used as a reward to a person for changing certain brain activities.

Neurofeedback may help cancer patients deal with the stress and mental side effects of chemotherapy. Also called EEG biofeedback. – *National Cancer Institute*.



[Study](#) published in *Integrative Cancer Therapies* says: In this study, breast cancer survivors demonstrated significant baseline impairments in self-reported cognitive function, fatigue, sleep quality, and psychological well-being as compared with a normal population. After 10 weeks (20 sessions) of neurofeedback, their performance in these areas had improved to levels indistinguishable from population norms.

BrainHQ

BrainHQ is an online brain-training program made by Posit Science. In late 2018, the National Cancer Institute recognized [BrainHQ](#) as an evidence-based cancer intervention. The NCI database describes it as an intervention designed to help breast cancer survivors troubled by chemo brain – *National Cancer Institute*.

[Study](#) published in *Journal of the American Geriatrics Society* says: Auditory Memory/Attention improvement was significantly greater in the experimental group [using BrainHQ games] than in the control group. Multiple secondary measures of memory and attention showed significantly greater improvements in the experimental group, as did the participant-reported outcome measure.

11. Reduce your stress and anxiety

People who have cancer may find the physical, emotional, and social effects of the disease to be stressful. Those who attempt to manage their stress with risky behaviors such as smoking or drinking alcohol or who become more sedentary may have a poorer quality of life after cancer treatment. In contrast, people who are able to use effective coping strategies to deal with stress, such as relaxation and stress management techniques, have been shown to have lower levels of depression, anxiety, and symptoms related to the cancer and its treatment – *National Cancer Institute*.

Progressive Muscle Relaxation (PMR) and Guided Imagery (GI)

[Study](#): The findings showed that patients with prostate and breast cancer undergoing chemotherapy treatment can benefit from Progressive Muscle Relaxation (PMR) and Guided Imagery (GI) sessions to reduce their anxiety and depression...PMR in combination with GI is more effective than standard treatment



alone in patients diagnosed with breast and prostate cancer receiving chemotherapy.

See [Manage Anxiety and Stress](#) page

12. Reduce Phlebitis

Sesame Seed Oil (*S. indicum*)

The intravenous administration of highly cytotoxic chemotherapy drugs can cause pain and result in damage to veins at the injection site. It can also cause inflammation of the vein (known as phlebitis) which can lead to a blood clot. Studies have shown that Sesame Seed Oil can be of great help to patients undergoing treatment.

For example, [this study](#) published in *Iranian Journal of Pharmaceutical Research* concluded: ... the findings show that the rate of phlebitis incidence in those who had not used the *S. indicum* [Sesame Seed Oil] was 70% more than that of those who used it... The present study proves that using *S. indicum* can play an important role in preventing and delaying the chemotherapy-induced phlebitis incidence.

This [study](#) published in *Complementary Therapies in Clinical Practice* concluded: Application of massage with sesame oil as a complementary method is effective in reducing the pain severity of patients with CIP [Chemotherapy-induced phlebitis].



13. Overall protection

Poly-MVA

Upon oral administration, the alpha-lipoic acid-palladium/vitamin/mineral supplement acts as a free radical scavenger, crosses the cell membrane and is able to transfer electrons from fatty acids to DNA via the electron transport chain in mitochondria, which protects against DNA damage. This could protect non-cancerous cells from the oxidative damage caused by radiation and chemotherapy.

Source: *National Cancer Institute*



See [Poly-MVA page](#)

14. Protect your Heart

The following can help:

Green Tea Extract

Study published in *Iranian Journal of Pharmaceutical Research* says: As a result, GTE could be a better option for ameliorating doxorubicin induced cardiotoxicity. We conclude that the GTE is able to prevent the cardiovascular abnormalities and pathological changes in biochemical markers, which were induced by doxorubicin.

L-Carnitine

Study of 40 patients published in *Journal of Cancer Research and Clinical Oncology* says: 20 patients were scheduled to receive L-carnitine before each chemotherapy cycle, followed by L-carnitine/day during the following 21 days, while 20 patients received a placebo (randomized controlled trial). Results: In the present study no cardiotoxicity of anthracycline [chemo drug] therapy was detected.

Co Enzyme Q10

Study says: **Two groups of children** with acute lymphoblastic leukemia or non-Hodgkin lymphoma, treated with anthracyclines (ANT), were studied: group I, consisting of 10 patients, with coenzyme Q10 (CoQ) therapy; group II, consisting of 10 patients without CoQ therapy...It is concluded that coenzyme Q10 given to patients with malignancy during ANT [chemo]therapy, is effective in protecting myocardial function from chemotherapeutic cardiotoxicity.



Salidroside

Study of 60 patients published in *Drugs in R&D* concluded: Salidroside can provide a protective effect on epirubicin[chemo drug]-induced early left ventricular regional systolic dysfunction in patients with breast cancer.

Muscadine Grape Extract

Study published in *Current Developments in Nutrition* says: MGE inhibited the proliferation of HER2 + BC and was synergistic when combined with TRZ [Trastuzumab] while protecting against TRZ cardiotoxicity. Thus, MGE may serve as an effective therapeutic either administered singly or in combination with TRZ for the treatment of HER2 + BC.

15. Protect your Kidneys

The following can help:

Short Hydration

(Outpatient chemotherapy with short-term hydration as opposed to chemotherapy in hospital with continuous hydration.)



Study

We conducted a consecutive retrospective analysis of **467 patients** who had been treated with chemotherapy including cisplatin.

We found that patients with short hydration illuminated a significantly lower frequency and severity of nephrotoxicity than those who with conventional hydration.

Short hydration not only makes cisplatin use more convenient by minimising the hydration volume and duration, but it also reduces nephrotoxicity, compared with conventional hydration.

Study of 102 patients published in *Tumori Journal* says: In several countries, to reduce nephrotoxicity after cisplatin administration, a 24-h hydration is recommended following a chemotherapy treatment in a hospital regimen. In our Institutions, cisplatin chemotherapy is an outpatient treatment that provides adequate hydration...Conclusions: These observations indicate that intermediate to high-dose cisplatin administration is feasible in outpatient management with a short hydration regimen without high risk of nephrotoxicity.

Study published in *Journal of Chemotherapy* says: Out of the **26 total patients**, 19 received the conventional regimen while 7 received the short hydration regimen. There was a higher nephrotoxicity was observed in the group receiving the conventional regimen (42.1%, 8/19) as compared to the short hydration regimen (0%, 0/7). There was a statistically significant difference in nephrotoxicity between the regimens.

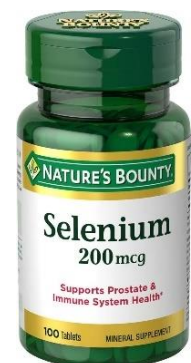
Magnesium

Study of 58 patients published in *Supportive Care in Cancer* says: Intravenous magnesium premedication has a protective effect on cisplatin-induced nephrotoxicity without the influence on the serum magnesium level. Magnesium premedication is a simple nephroprotective method that does not influence other adverse effects or rate of response to chemotherapy.

Vitamin E and Selenium

Study published in *Journal of Research in Medical Sciences* says: According to our findings, vitamin E and selenium can be used to reduce cisplatin-induced nephrotoxicity and bone marrow suppression.

Silymarin



Study of 60 patients published in the *Journal of Clinical and Diagnostic Research* says: This study showed that Silymarin can decrease Cisplatin nephrotoxicity, so because of safety profile and minor adverse effect of Silymarin, we can use it as prophylaxis against Cisplatin nephrotoxicity in various Cisplatin-contained chemotherapy regimens.

L-Carnitine

Study published by *PLOS ONE* says: Collectively, our results show that L-carnitine, a naturally occurring compound, can prevent the renal toxicity induced by carboplatin chemotherapy.

Study published in *Saudi Pharmaceutical Journal* says: L-carnitine should be viewed as a leading candidate and must be given along with doxorubicin, cisplatin, carboplatin, oxaliplatin, cyclophosphamide and ifosfamide to block their multiple organ toxicities and to permit larger doses of these anticancer drugs to be administered, thereby killing more cancer cells and increasing the chances of patient survival.

16. Protect your Liver

N-acetyl cysteine (NAC)

Study of 102 patients published in *Irish Journal of Medical Science* says: This study shows that NAC has a therapeutic effect on hepatotoxicity in children being treated with chemotherapeutic agents due to underlying malign diseases. The early reduction in the results of liver function tests is important for the continuation of chemotherapy.



17. Reduce Hand-Foot Syndrome

Hand-foot syndrome: blisters on palms of hands and feet.

Vitamin E

[Study](#) published in *Breast Care* says: In this retrospective study, 15 of **32 patients** with HFS [hand-foot syndrome] improved with vitamin E 100 mg/day, suggesting a beneficial effect of vitamin E therapy.

18. Reduce Oral Mucositis

The following can help:

Selenium

[Study](#) of **77 patients** published in *Bone Marrow Transplantation* says the results of their study showed that selenium supplementation during high-dose chemotherapy could prevent severe oral mucositis in patients undergoing bone marrow transplant.

Glutamine

[Study](#) published in *Cureus* concluded: glutamine significantly decreased the incidence and severity of chemo-radiotherapy-induced oral mucositis and dysphagia in patients with carcinoma of the oropharynx and larynx...glutamine significantly delayed the onset of oral mucositis and dysphagia. Glutamine improved the compliance to chemo-radiotherapy treatment and reduced the chances of hospitalisation for the management of treatment-induced toxicities.



Honey, Zinc, Selenium, Vitamin E, and Glutamine

[Review](#) of **fifty studies** published in *Integrative Cancer Therapies* says: There is plausible clinical evidence for the administration of honey, zinc, selenium, topical vitamin E, and glutamine as an adjuvant treatment to reduce the risk of developing oral mucositis during chemotherapy or radiotherapy.

19. Reduce taste problems

Miracle fruit (*Synsepalum dulcificum*)

[Study](#) published in *Cancer Treatment Reviews* says: **Miracle fruit** has been developed as a sweetness enhancer. Eight patients with various cancer types, chemotherapy regimens, and treatment phases (4–12 cycles) with taste changes received a miracle fruit supplement for two weeks following a crossover placebo design... Five out of eight patients experienced a metallic taste and reported that this taste disappeared with the use of the supplement... All patients reported that the taste of food improved during supplement use and an increased food intake was found in some of the patients.



20. Treat Insomnia

Studies show that as many as half of all patients have sleep-related problems. These problems may be caused by the side effects of treatment, medicine, long hospital stays, or stress – *National Cancer Institute*.

Cognitive Behavioral Therapy (CBT)

[Study](#) published in *Breast Cancer: Basic and Clinical Research* says:

Cognitive behavioral therapy for insomnia is one of the most effective therapeutic modalities for sleep disturbance in patients with breast cancer and has been associated with the improvement not only in patient-reported sleep measures but also in patient psychological distress levels and QOL. Cognitive behavioral therapy for insomnia is sustained over a longer time, when compared with pharmacologic



therapies, because it addresses the cause of the sleep disturbance and requires active patient participation in acquiring and maintaining skills to prevent and treat it.

[Study](#) published in *Current Sleep Medicine Reports* says: Insomnia is highly prevalent and persistent during the cancer trajectory, especially in patients with breast and gynecological cancer. Surgery and hospitalization, adjuvant treatments, nocturnal hot flashes, fatigue, and pain may trigger the onset of sleep disturbances. Several clinical trials have supported the efficacy of CBT to improve sleep of cancer patients. CBT is now recognized as the treatment of choice for insomnia comorbid with cancer.

21. Improve general fatigue

L-Carnitine (LC)

L-carnitine is a naturally occurring amino acid derivative that's often taken as a supplement.

This [study](#) published in *Molecular and Clinical Oncology* says: LC supplementation improved general fatigue in all cancer patients during chemotherapy. LC may improve the ability of cancer patients to cope with chemotherapy by reducing general fatigue and improving the nutritional status.

This [study](#) published in *Journal of Clinical Oncology* says: This study suggests that L-carnitine supplementation is safe up to 1250 mg /day and this dose may improve fatigue, mood, sleep in cancer patients with carnitine deficiency.

This [study](#) published in *Nutrition Journal* concluded: While these data are preliminary and need confirmation they indicate that patients with pancreatic cancer may have a clinically relevant benefit from the inexpensive and well tolerated oral supplementation of L-Carnitine.



22. Reduce Diarrhea

Activated charcoal, Glutamine, and Probiotics

This [2018 study](#) published in *Integrative Cancer Therapies* concluded: Activated charcoal, glutamine, and probiotics may also be beneficial in chemotherapy-induced diarrhea.

This [2019 study](#) concluded: The application of probiotics before or during chemo-therapy can effectively prevent the occurrence of CID [chemo-induced diarrhea] among cancer patients.

This [study](#) published in *The Journal of Hematology Oncology Pharmacy* says: In a randomized, double-blind, crossover study, Li and colleagues evaluated the prophylactic effect of **glutamine** in 54 patients with GI cancer. Patients were administered 20 g of IV alanyl-glutamine dipeptide on day 1 of chemotherapy and continued therapy for 5 days. Nausea and vomiting, as well as diarrhea, decreased significantly in patients treated with glutamine.

This study also reported on the benefits of **Probiotics**, including one clinical trial involving patients with colorectal cancer. *L rhamnosus GG* [probiotic] was administered orally twice daily for 24 weeks. A significant reduction in grade 3 to 4 diarrhea (22% vs 37% in the control group) was seen with probiotic therapy. In addition, decreased abdominal discomfort and fewer dosage reductions in chemotherapy were seen with the use of probiotics.

Immunocompromised patients should, however, be cautious of severe infections, such as sepsis, resulting from the use of probiotics.

A separate review of fifty studies found that activated charcoal, glutamine, and probiotics may also be beneficial in chemotherapy-induced diarrhea.



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